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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,255	08/20/2003	Fuyong Zhao	50325-0802	7564
29989 7590 05/31/2007 HICKMAN PALERMO TRUONG & BECKER, LLP 2055 GATEWAY PLACE SUITE 550 SAN JOSE, CA 95110			EXAMINER WU, JIANYE	
			ART UNIT 2616	PAPER NUMBER
			MAIL DATE 05/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/645,255

Applicant(s)

ZHAO, FUYONG

Examiner

Jianye Wu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/20/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) ✓  
Paper No(s)/Mail Date 2/5/04.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. **Claim 9-17** are rejected under 35 U.S.C. 102(a) as being anticipated by Flex Cho Zhao, "ANTD: An adaptive, Deterministic Ant Routing Algorithm", 3/16/07, hereinafter **Zhao**.

For **claim 9**, Zhao discloses a method of updating a routing table, the method comprising the computer-implemented steps of:

for each neighbor router in a set of neighbor routers (each neighbor router k, Section 3.4.1, page 12), associating the neighbor router with an amount of time predicted to be required for a data packet to travel to a specified destination if the data packet is transmitted through the neighbor router (trip time, first bullet of Section 3.4.1, page 12)

receiving a forward ant data packet that indicates the specified destination; selecting, based on one or more first specified criteria, a subset of the set of neighbor routers (forward ant packet, 2<sup>nd</sup> paragraph from bottom, Page 9);

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in response to receiving the forward ant data packet, selecting, from the subset of neighbor routers, a particular neighbor router that is associated with a first amount of time that is a lowest amount of time, relative to the specified destination, among amounts of time associated with neighbor routers in the subset of neighbor routers (2<sup>nd</sup> paragraph from bottom, Page 9 and Section 3.4.2, Page 13);

sending the forward ant data packet to the particular neighbor router (line 2 of 2<sup>nd</sup> paragraph from bottom, Page 9 and Section 3.4.2, Page 13);

receiving a backward ant data packet (line 2 of last paragraph in Page 9) that indicates a second amount of time taken for the forward ant data packet to travel to the specified destination (last paragraph, Page 9);

determining, based on information indicated in the backward ant data packet, whether one or more second specified criteria are satisfied; and

if the one or more second specified criteria are satisfied, then performing steps comprising:

updating the first amount of time based on the second amount of time (last paragraph, Page 9); and

if one or more third specified criteria are satisfied, then updating, based on information indicated in the backward ant data packet, the routing table (pheromone table, last paragraph of Page 9; Section 3.4.4 and 3.4.5, Page 14-16).

As to **claim 10**, Zhao discloses the method of Claim 9, wherein the one or more first specified criteria comprise a criterion that no neighbor router in the

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subset of neighbor routers is contained in a list of routers that have already been visited by the forward ant data packet (loop-avoidance router ID, first paragraph of Section 3.4.2, page 13).

As to **claim 11**, Zhao discloses the method of Claim 9, further comprising:  
determining whether any neighbor router in the set of neighbor routers is associated with an amount of time that is lower than the first amount of time; and  
if any neighbor router in the set of neighbor routers is associated with an amount of time that is lower than the first amount of time, then updating the forward ant data packet to indicate a present router in a loop-avoidance router field of the forward ant data packet (Section 3.4.2, page 13).

As to **claim 12**, Zhao discloses the method of Claim 11, wherein a loop-avoidance router field of the backward ant data packet indicates a router indicated by the loop-avoidance router field of the forward ant data packet (loop-avoidance router ID, first paragraph of Section 3.4.2, page 13).

As to **claim 13**, Zhao discloses the method of Claim 12, wherein the one or more second specified criteria comprise a criterion that the router indicated by the loop-avoidance router field of the backward ant data packet is not contained in a list of routers that the forward ant visited after visiting a present router (3rd paragraph of Section 3.4.2, page 13).

As to **claim 14**, Zhao discloses the method of Claim 9, wherein the one or more specified criteria comprise a criterion that the second amount of time is lower than any other amount of time, relative to the specified destination, among

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amounts of time associated with neighbor routers in the set of neighbor routers (Section 3.4.3, page 13).

As to **claim 15**, Zhao discloses the method of Claim 9, further comprising:  
determining whether a router from which the backward ant data packet was received matches a router associated with the destination in the routing table; and if the router from which the backward ant data packet was received does not match the router associated with the destination in the routing table, then updating a path feasibility flag of the backward ant to indicate that a path taken by the forward ant is not feasible (the path feasibility flag, 5<sup>th</sup> bullet of Page 12, and Section 3.4.3, Page 13-14).

As to **claim 16**, Zhao discloses the method of Claim 15, wherein the one or more third specified criteria comprise a criterion that the path feasibility flag of the backward ant indicates that the path taken by the forward ant is feasible (Section 3.4.3, Page 13-14).

As to **claim 17**, Zhao discloses the method of Claim 9, wherein the one or more third specified criteria comprise a criterion that a path taken by the forward ant data packet from a present router to the specified destination does not include any routers that are identified in a potential upstream node list (the path feasibility flag, 5<sup>th</sup> bullet of Page 12).

### ***Claim Rejections - 35 USC § 103***

3. The **following** is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

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be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-2, 4-5, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Teruhi et al (US 20030072269, hereinafter **Teruhi**) in view of J. Moy et al. IETF RFC 1247 "OSPF Version 2" July 1991 (hereinafter **Moy**) and Apostolopoulos, et al., INTF RFC 2676 "QoS Routing Mechanisms and OSPF Extensions", August 1999 (hereinafter **RFC 2676**)

For **claim 1**, Teruhi discloses a method comprising the computer-implemented steps of:

sending a first data packet (RTCP-SR, FIG. 10) from a sending router to a given destination via a particular router so that the packet arrives at the destination;

receiving a second data packet (RTCP-RR, FIG. 10) that indicates an second amount of time (74 of FIG. 4) from taken for the destination back to the sending router.

Teruhi is silent on the following:

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selecting the path that the first packet is predicted to reach the destination in a shortest time (the first time);

updating the shortest time based on the second time (the trip time of the second packet from the destination to the sending router); and

updating the routing table based on information contained in the second data packet.

Moy teaches shortest path (shortest-path, 3<sup>rd</sup> paragraph of Section 1.1, Page 2), RFC2676 further teaches the shortest path in term of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5).

Teruhi, Moy, and RFC 2676 all teach the same art (routing). Furthermore, Moy is explicitly cited by Teruhi, and RFC 2676 is an extension of Moy. One skilled in the art would have been motivated to combine them together to select the shortest (when measured in time) path for the first packet; and update the shortest (expectation) time with the second time and then update the routing table accordingly.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to choose the shortest path (in term of traveling time) and update the first (shortest) time and the routing table based on the information from the second packet for the benefit of efficiency of network.

As to **claim 2**, Teruhi, Moy, and RFC 2676 in combination disclose the method of Claim 1, further comprising: updating a path associated with both the destination and the particular router (by considering the particular router as the sending router in claim 1).



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As to **claim 4**, Teruhi, Moy, and RFC 2676 in combination disclose the method of Claim 1, whether a path taken by the first data packet is feasible (based on updated routing table).

As to **claim 5**, Teruhi, Moy, and RFC 2676 in combination disclose the method of Claim 1, further comprising: updating, based on information contained in the second data packet, a list of routers that indicates all routers in a path taken by the first data packet to a router that sent the first data packet to a present router (This is equivalent to applying claim 1 to each router of the list, therefore is rejected for the same reason as explained in claim 4 above).

As to **claim 7**, it is rejected for the same reason explained in claim 4 above.

5. **Claims 3 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Teruhi in view of RFC 2676.

As to **claim 3**, Teruhi discloses the method of Claim 1.

Teruhi is **silent on** the second data packet information including the bandwidth available on a path taken by the second data packet.

RFC 2676 teaches the routing packet containing QoS information (Line 3 of Page 5); particularly bandwidth information (Line 7 of Section 1.2, Page 5).

One skilled in the art would have been motivated to apply the teaching by RFC 2676 to the second packet to provide additional information for better routing options. Furthermore, OSPF technology taught by 2676 is cited by the applicant in the disclosure.

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Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include bandwidth information in the second packet for the benefit of efficiency of providing better routing options.

As to **claim 6**, it is rejected for the same reason explained in claim 3 above.

6. **Claims 8 and 18-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Moy in view of RFC 2676.

For **claim 8**, RFC 1247 disclose a method of updating a routing table, comprising steps of:

for each neighbor router in a set of neighbor routers (neighboring routers, page 4), selecting a shortest path to a specified destination via a set of neighbor routers;

send a first data packet to the specified destination;

receiving a second data packet from the specified destination;

updating the routing table based on information contained in the second data packet.

Moy **is silent on** the measurement parameter in routing table is the time (or delay) for a packet to travel from a source router to a destination router.

RFC 2676 discloses using delay (line 8 of Section 1.2, Page 5) as one of QoS parameters for routing measurement, which are used to the updating routing table. RFC 2676 teaches enhancement of OSPFv2 by Moy. It is nature for one skilled in the art to combine Moy with RFC 2676 to use time delay in the

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routing table, and update the routing table for the shortest path in term of delay time between two routers.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to using delay time as routing measurement parameters to update routing table.

As to **claim 18**, it is a computer-readable medium claim of the claim 8, therefore, is rejected for the same reason explained in claim 8 above.

As to **claim 19**, it is a means for claim of the claim 8, therefore, is rejected for the same reason explained in claim 8 above.

As to **claim 20**, it is an apparatus claim of the claim 8, therefore, is rejected for the same reason explained in claim 8 above.

### ***Conclusion***

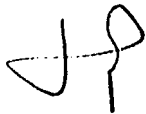
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jianye Wu whose telephone number is (571)270-1665. The examiner can normally be reached on Monday to Friday, 8am to 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571)272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jianye Wu



  
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